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Michael A. Shimokaji, Reg. No. 32,303

PATENT  
070-0105B

## NECK EXERCISER

### BACKGROUND OF THE INVENTION

- 5 [0001] The present invention generally relates to a neck exerciser device adaptable to providing physical conditioning and therapeutic benefits. In particular, the present invention is directed to a cap-like device employing weights to provide a pre-determined mechanical load to a user's neck and spine to exercise the neck as well as to alleviate soreness in the neck and even in the
- 10 back.
- [0002] Conventional exercise and/or health helmets often include an outer shell supporting a fixed number of weights located in pre-determined positions around the shell. Such helmets do not offer much flexibility in adjusting the size or position of the weights, nor do they accommodate a variety of head sizes in a
- 15 comfortable manner. One such device shown in United States Patent No. 6,000,066 includes an outer shell constructed of sturdy plastic supporting a number of weighted plates mounted on shafts extending from the shell. This helmet is limited to positioning weights only on opposite sides of the user's head. The weights must be carefully positioned the same distance from the
- 20 head to apply equal force on the head and neck. If one weight were farther from the head, a moment arm would be created which would apply a greater load to one side of the neck. Because the helmet is in the form of a shell formed of plastic, it cannot easily accommodate any unusual features of a user's head. Finally, in order to change the load, the collars would first have to
- 25 be removed before the weights could be repositioned.

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[0003] Many conventional helmet or similar health devices worn by a user employ a discrete number of weights that must be affixed to a helmet by some type of mechanical connection. The location of the weights is preset as well as the number of weights employed. Locking members may have to be removed  
5 before the weights can be removed and replaced/repositioned. An example of such a device is shown in U.S. Patent No. 6,000,066, wherein the helmet includes a weight holding shaft with a lock member at either end to prevent the weights from inadvertently separating during use of the helmet. In a further example of a conventional device shown in U.S. Patent No. 5,162,027, a  
10 plurality of weights are held in place by knob-shaped members mounted on a strip having hook and pile fastening devices of the type found in the product sold under the trademark VELCRO. While the weights may be repositioned on the strip, movement is limited to the location of the strip, surrounding the skull, and does not provide the ability to position the weights closer or farther from the  
15 neck as may be desired by the user to maximize the mechanical load and thus improve the exercise and therapeutic benefit of the helmet.

[0004] There is clearly a need for a cap-like device that may be worn by a user and is adaptable for easily employing a variety of weights that may be easily repositioned to optimize the mechanical load to the user's neck and/or  
20 back area. The cap-like device should be able to accommodate almost any head shape and size and should be capable of adding additional weights in an easy and convenient manner. As will become apparent, the present invention provides a device meeting each of these requirements.

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#### SUMMARY OF THE INVENTION

[0005] In one aspect of the present invention, a cap-like device has a shape generally conforming to a user's skull. The device may be made of fabric with an outer surface having numerous hook and pile fastening members such as  
30 may be sold under the trademark VELCRO. A plurality of separate weights

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have inner surfaces also formed with VELCRO fasteners. When the confronting surfaces of the weights and the device are brought into contact with each other, the VELCRO members adhere to each other, releasably fastening the weights to the device. In order to adjust the position of any weight on the device, it is merely necessary to separate the weight from the device, reposition the weight and bring the weight again into contact with the device, allowing the confronting VELCRO surfaces to adhere to one another. The various weights can be positioned on either side of a user's head as well as adjacent the forehead and the back of the head or even at the top of the user's head if desired to increase the mechanical load on the neck and spine.

**[0006]** In another aspect of the present invention, a weight belt may be positioned to surround the device and provide additional weights to increase the mechanical load. The weight belt may include a VELCRO surface adaptable for releasably fastening the weight belt to the device. The weight belt may be constructed with a number of separate, equally spaced pockets, with each pocket capable of holding a separate weight. To prevent the weights from accidentally separating from their respective pockets, the pockets may include foldable flaps adaptable to covering the pocket openings. The foldable flaps may be held in their closed positions by a VELCRO strip attached to the flap mating with a VELCRO strip mounted on the pocket. The weight belt provides a way of increasing the mechanical load of the device without using any permanent shafts to support the weights.

**[0007]** In another aspect of the invention, a weight support frame assembly may be mounted on the cap-like device to increase the mechanical load of the device. The support frame assembly may include a first band of generally circular configuration extending completely about the user's head and may be attached to the device by via a VELCRO inner surface mating with the VELCRO outer surface of the device. A second, generally semi-circular adjustable band extends between opposite sides of the first band and is adjustable about the circumference of the user's head. One or more weights may be mounted on the

adjustable band, whereby the user by adjusting the position of the second band is able to adjust the position and, more importantly, the mechanical load provided by the weights.

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[0007A] In another aspect of the invention, a method of exercising a user's  
5 neck and back includes placement of a cap-like device on the user's head. A  
plurality of weights are positioned about and then releasably fastened to the  
cap-like device. A weight belt may be mounted on the cap-like device in order  
to support one or more weights. Preferably, the weights are placed in the  
weight belt after it is attached to the cap-like device, however, it is within the  
10 method of the present invention to place one or more weights in the belt before  
the belt is mounted on the cap-like device. Alternatively, a weight support frame  
assembly may be mounted on the cap-like device after it on the user's head,  
allowing the user to alter the circumferential position of at least one weight  
supported by the frame assembly by loosening a pair of fasteners, rotating a  
15 weight supporting band and re-tightening the fasteners.

[0008] By providing a variety of ways to selectively position and reposition  
weights relative to position of the cap-like device, the mechanical loading effect  
of the weights can be easily altered without removing the device from the user's  
head.

20 [0009] These and other features, aspects and advantages of the present  
invention will become better understood with reference to the following  
drawings, description and claims.

#### BRIEF DESCRIPTION OF THE DRAWINGS

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[0010] Figure 1 is a perspective view of user wearing a headpiece device of  
the present invention;

[0011] Figure 2 is a further perspective view of the headpiece device  
formed in accordance with the present invention;

[0012] Figure 3 a perspective view of the headpiece device of Figure 2 having the weights removed;

[0013] Figure 4 is a top view of one of the weights used in the present invention;

5 [0014] Figure 5 a front view taken along the axis 5-5 of Figure 4, showing the weight attached to the headpiece device;

[0015] Figure 6 is a perspective view of a user wearing the headpiece device of the present invention including the weight band;

[0016] Figure 7 is a front view of the weight band utilized in the present invention as shown in Figure 6;

[0017] Figure 8 is a perspective view of a user wearing the headpiece device of the present invention including the weight support assembly;

[0018] Figure 9 is a perspective view of the weight support assembly shown in Figure 8; and

15 [0019] Figures 10-12 show attachment features of the weight support assembly shown in Figure 9.

#### DETAILED DESCRIPTION OF THE INVENTION

20 [0020] The following detailed description is of the best currently contemplated modes of carrying out the present invention. The description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating the general principles of the invention, since the scope of the invention is best defined by the appended claims.

25 [0021] Referring to Figure 1, a cap-like device 10 is shown as being worn by a user. Device 10 may include a pair of straps 12 and 14 for securing the device 10 to the user's head. The outer surface 16 of the device 10 may be formed of hooks and piles of the type utilized by VELCRO, or any similar fastening members. In addition, an inner portion of strap 14 may include a  
30 VELCRO or similarly formed inner surface 18 adaptable for mating with a

VELCRO outer surface portion of strap 12, as shown in Figure 2. Device 10 may also include a pair of ear openings 19, allowing device 10 to be comfortably fitted to the user's head.

5 [0022] As further shown in Figure 2, separate weight members 20 and 22 are selectively positioned adjacent to device 10. In particular, the weight 20 may be positioned adjacent to the rear portion of device 10, while the weight 22 is positioned adjacent to a forward or frontal portion of device 10. Additional weights members, not shown, may also be positioned on opposite sides of device 10, not shown. While a pair of separate weights 20 and 22 are shown,  
10 the number of weights is dependent on the mechanical load to be achieved. The user may even encircle the device 10 with weights each adjustably mounted via VELCRO or similar fastening members to device 10.

[0023] As shown in Figures 3-5, weight members 20 and 22 may include a concave-shaped inner surface 24 generally similar in shape to the outer surface  
15 16 of device 10. Preferably each inner surface 24 is completely covered with VELCRO or similar hook and pile members to maximize the surface area mating with device 10. Device 10 may be first placed on the user's head and the weight members 20 and 22 then brought into contact with the outer surface 16 of device 10, allowing the confronting VELCRO surfaces 16 and 24 engage  
20 and form a releasable connection. In order to relocate/reposition weight members 20 and 22 it is merely necessary to "strip" each weight from device 10, reposition the weights and again bring them into contact with outer surface 16 of device 10. All of this can be accomplished without removing device 10 from the user's head as may be required for many conventional assemblies.

25 [0024] Another aspect of the invention is shown in Figures 6 and 7, include a separate weight belt 30 completely encircling and releasably attached to the cap-like device 10. Weight belt 30 may include a VELCRO inner surface, not shown, joining with the VELCRO outer surface 16 to releasably fasten weight belt 30 to device 10. Weight belt 30 may be constructed with a plurality of  
30 similar, yet separate pockets 32. A separate foldable flap 34 covers the

opening 36 of each pocket 32. Each of the foldable flaps 34 may include a VELCRO strip arranged to selectively engage a similar strip formed on the pocket. A VELCRO strip 38 attached to an outer end surface of weight belt 30 may engage a similar VELCRO strip 40 disposed on the opposite end inner  
5 surface of weight belt 30 for maintaining weight belt 30 in its generally circular configuration surrounding device 10. Separate weights 42 may be deposited in selective pockets 32 to increase the mechanical load device 10 provides to the user's neck and/or back. Preferably, for every weight positioned in a pocket 32, a separate weight is positioned in a separate pocket 32 on the opposite side of  
10 weight belt 30. The particular arrangement of weights 42 may be easily altered by merely unfolding the particular flaps 34, removing and repositioning the weights 42 before inserting them in their new pockets 32. Each flap 34 may then be refolded into position covering its respective pocket opening 36. Movement of the weights from pocket to pocket may be achieved with the  
15 device 10 and weight belt 30 being worn by the user. This allows the user to obtain immediate feedback as to the effect of repositioning or varying the number of weights.

**[0025]** In another aspect of the present invention, a weight support frame assembly 50, as shown in Figures 8 and 9, may be mounted on cap-like device  
20 10. Frame assembly 50 may include a first band 52 of generally circular configuration extending completely about device 10. Band 52 may be fastened to headpiece device 10 by having a VELCRO inner surface 53 joining the outer surface 16 of device 10. A second, generally semi-circular adjustable band 54 extends between opposite sides of the band 52. Adjustable band 54 may be  
25 formed of plastic, aluminum, or even leather or similar material capable of supporting one or weights in a manner as described. A pair of adjustable fastener assemblies 60 extends between band 52 and opposite ends of band 54. As will be discussed in detail below, fastener assemblies 60 may be rapidly loosened and re-tightened after band 54 is repositioned relative to band 52.

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[0026] One or more weights 58 may be selectively mounted on adjustable band 54 so as to alter the mechanical loading of the assembly 50. As shown in Figure 8, a number of generally evenly spaced openings 62 extend along the length of adjustable band 54. A weight support pad 64 including fastening protrusions mounted on either end, not shown, is disposed at a desired position on band 54, with the protrusions extending through the openings to releasably fasten pad 64 to band 54. The outer surface 66 of pad 64 may be covered with VELCRO or similar hook and pile attachment members adaptable to mating with a similar VELCRO surface 68 formed on a confronting face of the weight 58. As weight 58 is brought into contact with pad 64, the confronting VELCRO surfaces join each other to releasably fasten weight 58 to pad 64. Pad 64 may be selectively moved in opposite circumferential directions Y-Y along band 54 by merely removing and repositioning pad 64 so that its protrusions are aligned with a pair of openings 62 in pad 64. Likewise, weight 58 may be moved in opposite circumferential directions X-X along pad 64 by merely "striping" weight 58 away from pad 64, repositioning the weight and bringing the weight again into contact with pad 64, allowing the confronting VELCRO surfaces to adhere to each other. Movement of weight 58 along pad 64, as well as the movement of pad 64 along adjustable band 54 may all be accomplished while device 10 is worn by the user. This allows the user to immediately "feel" the different effect achieved by movement of the weights.

[0027] As shown in Figures 8-10, each fastener assembly 60 includes confronting tooth-shaped portions 70 and 72 formed on facing portions of bands 52 and 54, respectively. Each of tooth-shaped portions 70 and 72 further includes a though opening 74 or 76, adaptable to being aligned when band 54 is mounted on band 52. A separate threaded screw member 78 may be inserted completely through each opening 76 in tooth portion 72 and into the opening 74 in tooth portion 70 in order to tighten the confronting tooth-like portions to each other. When each of the fastener assemblies 60 is fully tightened, the second, adjustable band 54 is rigidly fastened to the first band 52.



10 15 In order to circumferentially adjust the position of band 54, it is merely necessary to loosen each threaded screw member 78 a sufficient distance before rotating band 54 relative to band 52. Once band 54 is repositioned on the user's head, the threaded screws 78 are sufficiently re-tightened to press band 54 into tight engagement with band 52.

20 25 **[0028]** In another aspect of the invention, weight 58, pad 64 and band 54 may be joined using either the removable fasteners 80 as shown in Figures 9 and 11 or the deformable fasteners 82 as shown in Figures 9 and 12. A removable fastener 80 may protrude from a weight 58 into one of plurality of openings 83 formed in pad 64. Likewise, a deformable fastener 82 may extend from pad 64 into one of the plurality of openings 62 formed in band 54. In either arrangement, weight 58 may be relocated by pulling it away from pad 64 and reinserting it into a different opening 83. Alternatively, a plurality of weights 58 each may be mounted on a single pad 64 or each weight 58 may be mounted on it own separate pad 64.

30 35 **[0029]** The toothed-shaped members 70 and 72 forming fastener assemblies 60 may be formed of plastic or any light-weight metal or metal composites such as Aluminum or its alloys. Because device 10, weight belt 30 and weight support frame assembly 50 are all formed of light-weight, flexible materials, the device 10 even with one or more of the attachments be light weight and be able to conform to almost any head size and/or shape. It is, of course, within the scope of the present invention to make device 10 in any desired size or shape in order to meet a user's particular needs.

40 45 **[0030]** In another aspect of the present invention, a method of exercising a user's neck and back by selectively altering mechanical loads is achieved while the device 10 is being worn by the user. Once the device 10 is positioned on the user's head, weights 20 and 22 are positioned adjacent to the outer surface of device 10 at pre-selected locations. The positions of the weights are altered by stripping the weights from the device 10 and repositioning them. The method may include the further step of positioning a weight belt 30 about device

10 as it is worn by the user. Weights 38 are positioned in various pockets 32 of weight belt 30 while belt 30 is attached to device 10 provide feed back any changes in the mechanical load. The method may include the further step of mounting the weight support frame assembly 50 on the device 10 and  
5 selectively positioning one or more weights on the frame to alter the mechanical load of the assembly on device 10 and ultimately on the user.

[0031] It should be understood, of course, that the foregoing relates to preferred embodiments of the invention and that modifications may be made without departing from the spirit and scope of the invention as set forth in the  
10 following claims.

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